Hereditary Footpad Hyperkeratosis

Affected breeds: Irish Terrier

Hereditary Footpad Hyperkeratosis: Affected pups develop deep cracks or corns on their paw pads, which arise due to an excessive thickening of the outer layer of skin. The condition appears at 4-5 months of age and affects all four feet. This can lead to considerable pain and lameness. The basis for the condition is an inherited defect in the development of the skin layers.

Hereditary Footpad Hyperkeratosis is caused by a recessive genetic mutation. This means that dogs which carry the mutation ("CARRIERS") are normal but will pass the mutation on to an average of 50% of their offspring. Puppies which inherit two copies of the mutation will have Hereditary Footpad Hyperkeratosis ("AFFECTED").

Breeders can now avoid Hereditary Footpad Hyperkeratosis by testing their breeding animals, and choosing appropriate breeding combinations.

This test is particularly useful for breeders:

- To test their breeding stock so that they can avoid mating combinations which would risk AFFECTED puppies.
- To conclusively confirm Hereditary Footpad Hyperkeratosis if diagnosis is unsure.

This test will be reported as:
CLEAR : no evidence of the Hereditary Footpad Hyperkeratosis mutation
CARRIER : carries one copy of the defect, which will be passed to 50% of offspring
AFFECTED : carries two copies of the defect, and will have Hereditary Footpad Hyperkeratosis

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated. Avoid the combinations in red:
AFFECTED X AFFECTED = 100% AFFECTED
AFFECTED X CARRIER = 50% AFFECTED, 50% CARRIER
AFFECTED X CLEAR = 100% CARRIER
CARRIER X CARRIER = 25% AFFECTED, 50% CARRIER, 25% CLEAR
CARRIER X CLEAR = 50% CARRIER, 50% CLEAR
CLEAR X CLEAR = 100% CLEAR

References
Drogemuller M, Jagannathan V, Becker D, Drogemuller C, Schelling C, et al. (2014) A Mutation in the FAM83G Gene in Dogs with Hereditary Footpad Hyperkeratosis (HFH). PLoS Genet 10(5): e1004370. doi:10.1371/journal.pgen.1004370